START COPY

3140 Finley Road
Downers Grove, IL 60515
630.795.3200
Fax: 630.795.1130

Clayton GROUP SERVICES

Sent via e-mail

March 5, 2004

Mr. Kevin Turner
USEPA REGION V
Emergency Response Branch
8588 Rt. 148
Marion, IL 62959

Mr. Steven Faryan
USEPA REGION V
Emergency Response Branch
HSE-5J
77 West Jackson Blvd.
Chicago, IL 60604-3590

Clayton Project No. 15-03095.14-003

Subject: **Response to United States Environmental Protection Agency Letter, dated February 6, 2004**
Regarding Comments to Investigation Plan and related Appendices, Prepared by Clayton Group Services, Inc., dated January 7, 2004, Hartford, Illinois (Illinois EPA# 1190505040 – Madison County)

Dear Messrs. Turner and Faryan:

Clayton Group Services, Inc. (Clayton), on behalf of the Hartford Working Group (Group), has reviewed the comments provided under United States Environmental Protection Agency (USEPA) cover dated February 6, 2004. The USEPA and the Illinois Environmental Protection Agency (Illinois EPA) addressed the Investigation Plan to Define the Extent of Free Phase and Dissolved Phase Hydrocarbons in the Village of Hartford, Illinois (Investigation Plan), dated January 7, 2004 and prepared by Clayton. The comments are summarized in this document with accompanying responses.

USEPA

Comments

USEPA/START recognizes the current site boundaries are North Olive Street to the east, East Hawthorne Street to the south, North Old St. Louis Road to the west and Rand Avenue to the north. However, during current investigations using CPT/ROST™ technology to determine the extent of free-phase hydrocarbons (FPH), if FPH is indicated beyond these boundaries then expanding the site boundaries up to other neighboring points of compliance may be warranted.

Response

In the event the CPT/ROST™ findings indicate FPH beyond the above-delineated areas, it is the intention of the Group to expand the CPT/ROST™ investigation as appropriate, in recognition of limitations posed by available public access right of ways and associated utilities. A plan to confirm the boundaries of the FPH is being developed and will be submitted to the Agencies by April 9, 2004. This plan will include the collection of soil samples and the installation of monitoring wells.

Comments

USEPA/START believes future work plan submittals should incorporate aquifer pump testing to determine and verify aquifer hydraulic characteristics. The data is intended to assist in understanding the hydrogeology of the site and to enhance the final remedy selection. The testing can be performed at a later stage of investigation.

Response

Future work plan submittals may incorporate aquifer-pumping tests, if deemed necessary to determine and verify aquifer hydraulic characteristics. This testing would be performed at a later stage of investigation.

Comments

Please add a bullet to Section 1.0 Introduction/Purpose of the Investigation Workplan, which states that one of the purposes of the Investigation Workplan, is the collection of data to support a remedy selection and subsequent design.

Response

It is understood that one of the purposes of the Investigation Workplan is the collection of data to support a remedy selection and subsequent design. This item is incorporated in Section 1.0 of the Investigation Workplan by reference in this document.

Comments

The current plan lacks information regarding an explanation and current understanding with fate and transport mechanisms of site contaminants. The USEPA requests a summary from existing data developed by Clayton and other contractors. The intent is to provide a synoptic view of the current status of the fate and transport of the site

contaminants, and also for comparison with future groundwater models as data gaps are filled and the Conceptual Site Model (CSM) is enhanced.

Response

The following is summarized from the Investigation Workplan, numerous spills/releases have occurred from multiple areas/sources throughout the northern portion of Hartford. It is well known that the fate and transport of petroleum products is primarily dependent upon the hydrogeologic conditions of the site as well as specific characteristics (i.e. Henrys Law) of each chemical of concern. Based on the investigations conducted to date by others, the hydrogeology of the Hartford vicinity consists of three aquifers or hydrostratigraphic units that vary from unconfined to confined conditions. The aquifers generally consist of coarse- to fine-grained permeable sands deposited within low permeability silty clays. The units, which are separated by clay and silty clay layers, are known as the Rand Sand, the EPA Sand, and the Main Sand (Mathes 1991).

Based on the nature of petroleum, once released, it can migrate throughout the subsurface as a separate phase, as a dissolved phase, and as vapors within the soil gas. Free phase petroleum hydrocarbon will migrate down under the force of gravity with some concurrent lateral spreading (API undated). The downward movement of free phase is eventually stopped by one of three occurrences: the petroleum source is exhausted to immobility, the source encounters a low permeability lithology, or it reaches groundwater. Volatilization into the soil gas, sorption to the geologic materials, dissolution in pore water, and biodegradation processes may occur as the FPH migrates downwards. Secondary porosity features, such as fractures within clay soil, can enhance vertical migration of petroleum hydrocarbon through lower permeability materials. The higher effective porosity of the more permeable sand units also serves to enhance vertical petroleum migration. Upon reaching groundwater, the FPH is then subject to vertical smearing due to water table fluctuations and horizontal migration, primarily in the direction of groundwater flow.

Currently, the extent of the FPH beneath the northern portion of the Village of Hartford is not fully delineated. However, as discussed in the Clayton Memorandum to Mr. Kevin Turner of the USEPA dated January 27, 2004, regarding the Approach to CPT/ROST™ Investigation, sentinel wells which bound the southern portion of the plume show neither FPH or dissolved phase petroleum products. Numerous reports of odor complaints and fires within the Village of Hartford over the years indicate that vapor migration is a significant process, whether a result of direct volatilization from the FPH (or residual) or biodegradation (methanogenesis). Several soil gas surveys have been conducted by other consultants within and adjacent to the Village of Hartford in 1990. The results of the surveys indicated elevated petroleum concentrations in the soil gas from collection points

over a wide portion of the northern area of the Village. However, in Clayton's opinion, these historic results should only be viewed in a qualitative manner based on the original intents of the survey and the relative limited number of sampling points and limited nature of the investigation, especially in regards to the Village infrastructure. It is known that vapor migration within the vadose zone can be influenced by many factors (e.g. barometric pressure, permeability etc.) and as a result the occurrence of vapor concerns can be highly variable over time. This temporal variability is reflected in Table 2-1 (Documented Odor Complaints/Observations Within the Village of Hartford, Illinois) contained in the January 7, 2004 Investigation Plan. Likely pathways for vapor migration into homes include underground utilities and potentially permeable foundation fill around the homes.

The groundwater flow beneath the Village in 1990 was determined to be to the northeast beneath the northern portion of Hartford (Illinois EPA, 1990). The Clayton Investigation Workplan presented a Groundwater Contour Map of the northern portion of the Village for December 2003, which indicated a northerly groundwater flow direction. As indicated by Engineering-Science (1992), the groundwater flow direction has been controlled by the groundwater pumping conducted by Amoco and Shell since 1951. According to the Illinois EPA (1990), the hydrocarbon appeared to be pooled in a depression in the top of a permeable sand layer. Engineering-Science (1992) also stated that a thick continuous clay layer, increasing in thickness to the east under Hartford, may serve as a barrier to hydrocarbon movement and effectively traps the FPH creating an area of FPH accumulation.

Comments

USEPA/START recommends that rainfall amounts and Mississippi River gauge data be collected for comparison with current well gauging data collection activities. This data will correlate site groundwater hydraulic head rise trends with future vapor intrusion complaints.

Response

The Group agrees that Mississippi River gauge data be collected as discussed in the above comment. The Group proposes to accomplish this through the use of the United States Geological Survey (USGS) 07010000 Mississippi River at St. Louis, Missouri gauging station, located at Latitude 38°37'44" and Longitude 90°10'47" NAD27, which is approximately 15 miles downstream from Hartford, Illinois. This is the same gauging station used to create the Mississippi River hydrographs discussed in Section 2.5 of the Investigation Workplan. This data was downloaded from the USGS Water Resources (2003) website. In general, the USGS Station records provide data approximately every

two weeks on the above website. If additional gauging data is deemed necessary, the USGS will be contacted to determine the availability of additional information.

The Midwestern Regional Climate Center has a precipitation observing site located at the Alton St. Louis Regional Airport (approximately 5 miles north of Hartford). Daily precipitation data is available from this site. This data will be used for comparison with current well gauging data. The Group is also looking at establishing a weather monitoring station in Hartford.

Illinois EPA

Comments

Section 2.5 attempts to relate migration of vapors into homes with high groundwater levels. This relationship is not likely as direct as presented.

Response

The Group agrees that the relationship is not as direct as presented. Section 2.5 was intended to present previous opinions by other parties that have investigated the Village of Hartford. Section 8.0, Conceptual Site Model (CSM) of Hydrocarbon Impact was intended to be a presentation of the current CSM. As indicated in Section 8.0 of the Investigation Work Plan, the most likely cause of vapor migration into the homes within the northern portion of Hartford is related to subsurface utilities.

The Village of Hartford utilities such as stormwater drainage systems and sanitary systems, is located primarily within the low permeability alluvial silts and clays overlying the three identified higher permeability hydrostratigraphic units (the Rand Sand, the EPA sand and the Main Sand) along with petroleum pipelines that traverse and ring the perimeters of the Village. Spills and releases have been documented within the Village since the 1970s in association with these petroleum pipelines and from other sources (e.g., leaking underground storage tanks). Village records document that petroleum releases have impacted the Village utilities. In general, the northern portion of the Village of Hartford, east of the railroad bisecting the center of Hartford, is served by a combined storm and sanitary sewer system while only West Maple, West Watkins, West Forrest, and West Elm Streets have separate storm and sanitary sewers to the west of the railroad. Little is known about the current condition of the Village utilites. However, past releases have been found to be leaking into the Village sewer system on East Watkins Street leading to the possibility that the overall combined sewer system utilities may have numerous areas of deterioration or leaks. As a common practice, the Village

would flush the sewers upon discovery of petroleum product in the sewers. This activity, while serving to clean out the majority of the petroleum from the sewer lines, would also serve to drive it to "upgradient areas" and to force it through potential leaks within the piping systems. This would likely cause further distribution of petroleum contaminated soil, or potentially residual petroleum product, within the utility corridor.

A plausible source of the petroleum hydrocarbon vapors are from these surface or near surface petroleum releases that have encountered the Village utilities and entered the lines (e.g., sewer or storm drain) or migrated within the more permeable backfill surrounding these utilities, which connect to the residential and commercial/public structures of the Village that in turn may have more permeable foundation fills. During heavy rainfall, a saturated front, created by the precipitation as it advances through the near surface and subsurface, creates pressurization on the hydrogeologic system and likely serves to drive vapors from the contaminated soil and/or residual product surrounding the infrastructure or within the lines themselves through the utility corridors and into the structures of Hartford. It is also likely that, during heavy rainfall, the surficial soils will become saturated which will serve to act as a cap to potential escape of vapors from the subsurface; thereby, enhancing the concentrations of vapors into homes.

As noted in Section 8.0 of the January 7, 2004 Investigation Plan, another plausible source of the petroleum hydrocarbon vapors is the existing plume of FPH. A rise in the groundwater surface will naturally lead to a rise in the overlying FPH that will drive vapors up out of the subsurface through the overlying soils (especially the more permeable sands) and potentially into subsurface utility trenches (especially in those areas where some of the utility lines are buried deeper and are close to the interface between the overlying silts and clays and the underlying sand). Secondary porosity features in the clays (such as fractures) may also enhance flows of vapors into the overlying utility trenches and foundation fills that allow the vapors to enter structures.

Comments

The proposal to use ROST™ technology to determine the extent of free-phase hydrocarbons appears acceptable. As proposed, a subsurface investigation shall be performed to confirm the results of the ROST™ investigation. The location of the borings in a more detailed investigation of the area must be based on the results of this investigation.

Response

A concurrent subsurface investigation is being performed to confirm the results of the ROST™ investigation, as presented in the CPT/ROST™ Investigation Memorandum to

Kevin Turner of USEPA from Clayton, dated January 27, 2004. The subsurface investigation is being based on the results of the CPT/ROST™ Investigation.

Comments

Additional locations must be investigated, as necessary, using ROST™ so that the horizontal extent of free phase hydrocarbon is clearly established.

Response

The Group received a similar comment from the USEPA. As stated in response to the USEPA comment above, the Group recognizes that the CPT/ROST™ findings may indicate FPH beyond the site boundaries. In that event, it is the intention of the Group to expand the CPT/ROST™ investigation as appropriate, in recognition of limitations posed by available public access right of ways and associated utilities.

Comments

The Workplan for Permanent Wells and Soil Sampling, to be submitted April 1, 2004, should also contain the results of: (1) the ROST Investigation; and (2) one comprehensive assessment of groundwater elevations and flow direction within the Hartford site and the areas to the north and east of the site.

Response

The Work Plan for Permanent Wells and Soil Sampling will also contain the results of the above two items. As agreed during our meeting in Collinsville on February 24, 2004, this work plan will be submitted by April 9, 2004.

Comments

The Workplan for Additional Investigation for dissolved groundwater contamination, to be submitted July 2, 2004, should also contain the results of the direct push groundwater sample collection effort proposed to start April 16, 2004 as well as detailed background information about the geology and hydrogeology of the site.

Response

The Work Plan for Additional Investigation for dissolved groundwater contamination will also contain the results of the direct push groundwater sample collection effort proposed to start April 16, 2004. As part of the Investigation Workplan, dated January 7,

2004, the Group has already submitted detailed background information about the geology and hydrogeology of the site. The Group intends to enhance the previously submitted information as information becomes available or is developed.

Comments

The Work Plan for Investigation of Pipeline Sources to be submitted July 2, 2004 must also contain detailed information regarding the results of all research and efforts scheduled to begin February 2, 2004 to identify all utilities and pipelines in the area. The efforts to be carried out during the work scheduled to start February 2, 2004 should include: (1) a review of utility clearance information; (2) inspecting manholes; (3) using electromagnetic and resistivity surveys; (4) test pits; and (5) reviewing other available information.

Response

The Work Plan for Investigation of Pipeline Sources, to be submitted July 2, 2004, will also contain detailed information regarding the results of all research and efforts to identify all utilities and pipelines in the area. The efforts anticipated to be carried out may include, but not be necessarily limited to, items 1 through 5 listed in the above comment.

Comments

The Investigation Workplan indicates a GIS database will be prepared for the Village of Hartford. This database should include information regarding: (1) soil and groundwater data; (2) location of fire and vapor incidents; (3) location of pipelines and other utilities; and (4) data from the ROST investigation.

Response

The GIS database being prepared for the Village of Hartford will include, but not necessarily be limited to, items 1 through 4 listed in the above comment.

Comments

Any potentiometric map identifying groundwater elevations for the newly installed groundwater monitoring wells must also identify current groundwater elevations in all groundwater monitoring wells in the vicinity of the Village of Hartford.

Response

Potentiometric maps, identifying groundwater elevations for the newly installed groundwater monitoring wells (HMW-25 through HMW-29), will also identify current groundwater elevations in all appropriate groundwater monitoring wells in the vicinity of the Village of Hartford.

Comments

It must be noted that the locations of active Hartford Supply wells WSW-60105 and WSW-60106, and inactive Hartford Supply wells WSW-60103 and WSW-60104 are inaccurately placed on the North Hartford Map in Figure 2-1 of the subject document.

Response

The locations of the above active and inactive Hartford Supply wells have been corrected based on information provided by the Illinois EPA.

Comments

Section 7.0 Groundwater Flow of the Investigation Workplan states that the gauging data reflects water that has entered each well bore from several hydraulically separated, saturated intervals. Therefore, the data does not accurately reflect the groundwater elevation of the Main Aquifer. Groundwater flow maps of the entire area, including Rand Avenue and the Premcor Property, should be developed to provide an accurate representation of the groundwater gradient of each saturated unit present beneath the area. These maps should not represent a composite measurement of the numerous wells screened in the various zones.

Response

The Group acknowledges that groundwater flow maps prepared for this site should not include wells that may present a composite measurement of different hydrostratigraphic units.

Comments

Section 9.0 Data Gaps of the Investigation Workplan states that the existing wells are limited in extent, both vertically and laterally in regard to identifying the extent of the known FPH within the groundwater of the Village. As the ROST™ data is gathered and

maps are constructed, the hydrocarbon data from the Premcor Property should be used to complete the thickness maps along the eastern Village boundary.

Response

Available hydrocarbon data from all surrounding properties will be used to enhance FPH maps developed using the ROST™ data. This will be done in concert with subsurface investigations and other appropriate information used to corroborate the ROST™ information.

Comments

Volume III Appendices D through H of the Investigation Workplan contains several standard operating procedures (SOPs). However, it does not contain any provisions for continued well maintenance throughout the remediation period. It is recommended that a well maintenance and rehabilitation program be developed to extend the life of the well and to document that the wells are functioning properly.

Response

Attachment A contains SOP No. 213, Well Maintenance & Rehabilitation, which will be used to document that the wells are functioning properly.

If you have questions, please feel free to contact me at (630) 795-3207.

Sincerely,

Monte M. Nienkerk

Monte M. Nienkerk, P.G.
Senior Project Manager
Environmental Services

cc: Hartford Working Group
Tom Binz (TT EMI / USEPA)
Jim Moore (IEPA, Springfield)
Chris Cahnovsky (IEPA, Collinsville)

15-03095.10ca007 / 03/02/04 /KDC

Clayton
GROUP SERVICES

ATTACHMENT A

STANDARD OPERATING PROCEDURE NO. 213
WELL MAINTENANCE & REHABILITATION

Standard Operating Procedure No. 213

WELL MAINTENANCE & REHABILITATION

1.0 PURPOSE OF PROCEDURE

Standard Operating Procedure (SOP) No. 213 describes the guidelines for inspecting, maintaining and rehabilitating wells as described in the Work Plan or as otherwise specified. Well inspections and maintenance are performed to ensure the integrity of the well over extended periods of time and identify circumstances that warrant well rehabilitation/corrective action (i.e. redevelopment, repair, replacement, etc).

2.0 EXECUTION

2.1 GENERAL REQUIREMENTS AND CONSIDERATIONS

A. Inspections should be performed on an annual basis on wells for the following reasons:

1. To verify the structural integrity of the well above and below ground.

2. To identify significant silt/sediment buildup in wells.

3. To identify biofouling that would contribute to corrosion of structures and to a decrease in the efficiency of sampling recovery and pumping operations.

B. All equipment, including water level indicators, oil/water interface probes, slug, and bailers should be decontaminated before and after introduction into wells. Decontamination should be followed in accordance with SOP No. 500.

C. Personnel involved in well maintenance procedures shall follow the prescribed Site Health and Safety Plan (SHSP).

2.2 INSPECTION/MAINTENANCE METHODS

2.2.1 Above Ground Well Structural Integrity Inspection

A. Above ground well components including protective casing/flush-mount cover, bumper posts (if present), concrete pad or apron (if present), expandable cap, and locking mechanism will be inspected during each sampling or well gauging event.

B. Observations made during the above ground well integrity inspection shall be documented on the Existing Observation Well Integrity Survey Form.

C. Problems identified during the above ground well integrity inspections shall be evaluated on a case-by-case basis to implement within a reasonable period of time an appropriate corrective action (i.e., protective cover/flush-mount cover, lock, expandable cap replacement, etc.).

2.2.2 Below Ground Well Structural Integrity Inspection

A. Monitoring Wells

A stainless steel or PVC slug, with a diameter and length equivalent to the sampling pump or standard bailer, shall be lowered the entire length of the well once every two years to evaluate the presence of obstructions or damage to the well casing and screen. If the slug cannot be lowered to within the screened interval, the problem shall be evaluated on a case-by-case basis to implement within a reasonable period of time an appropriate corrective action (i.e., silt/sediment removal and redevelopment, well replacement, etc.) instituted within a reasonable period of time.

B. Vapor Extraction Wells

Vacuum and airflow rates shall be measured periodically and compared to previous steady-state measurements. If a significant change in measurements is observed, the problem shall be evaluated on a case-by-case basis to implement within a reasonable period of time an appropriate corrective action (i.e., process equipment malfunction repair, removal of silt/sediment, removal of biomass and cleaning with an approved biocide, well replacement, etc.) instituted within a reasonably period of time.

C. Recovery Wells

Recovery rates shall be evaluated at least once every quarter and compared to previous measurements. If a significant change in rates is observed, then problem shall be evaluated on a case-by-case basis to implement within a reasonable period of time an appropriate corrective action (i.e., equipment malfunction repair, removal of silt/sediment, removal of biomass and cleaning with an approved biocide, well replacement, etc.) instituted within a reasonably period of time. Rehabilitation will be considered complete after typical recovery rates are achieved.

2.2.3 Siltation/Sedimentation Inspections (Monitoring and Recovery Wells)

Total depth measurements shall be obtained annually and compared to the baseline total depth measurements obtained at the time of the well installation, development and/or start of the project. If a significant amount of silt/sediment obstructs the well screen and/or impairs the performance of the recovery pump, then the well shall be surged and redeveloped in accordance with SOP 212: Well Development.

3.0 PROCEDURES

A. Measure the depth to groundwater and total depth of the well in accordance with the guidelines in SOP No. 220.

B. Document observations made during the above ground well integrity inspection on the Existing Well Integrity Survey Form. A copy of this form is provided in Attachment 1.

C. Document observations made during the below ground well integrity inspections in the logbook as outlined in SOP 110.

D. Evaluate and implement corrective action(s)/well rehabilitation consistent with standard industry practices. Notify the appropriate agency, if necessary. Document these activities in the logbook and/or field forms in accordance with SOP 110.

E. Containerize development water in DOT-approved 55-gallon drums or other approved storage container and dispose of at a licensed facility.

F. Appropriate personal protection should be used when encountering wells containing product or strong product odors that exceed the action levels specified in the SHSP.

4.0 DOCUMENTATION

Well inspection, maintenance, and rehabilitation activities shall be documented in the field logbook including a description of the activities, procedures used, and any significant occurrences that are observed during inspections and the implementation of corrective actions/well rehabilitation. The above ground well structural integrity inspection should be recorded on the Existing Well Integrity Survey Form (Attachment 1).

ATTACHMENT 1

EXISTING WELL INTEGRITY SURVEY FORM

EXISTING WELL INTEGRITY SURVEY FORM

PROJECT INFORMATION

Project Name: _____ Date(s) of Inspection: _____

Project No.: Field Personnel:

WELL INTEGRITY INFORMATION

Well ID	Static Levels			Well Casing		Security		Protective Cover			Flush Mount				Concrete Pad				Bumper Posts			Grade/Slope			Additional Comment(s) Below
	Depth to Product (FT BTOC)	Depth to Water (FT BTOC)	Total Well Depth (FT BTOC)	Diameter (Inches)	Material	Well Secured/Locked	Well Cap Present	Present	Intact	Dented	Present	Intact	Cracked	Rubber Seal Present	Present	Intact	Cracked	Shifted Out of Place	Intact	Bent	Missing	Away From Well	Facilitates Access	Standing Water	

ADDITIONAL COMMENTS: _____